THE IMPACT OF RISK MANAGEMENT & COMMODITY DERIVATIVES

MARKET WITH ALLUSION TO GOLD MARKET

SHRADDHA VERMA[1] & RICHA VERMA[2]

[1]Lecturer, Department of Business Administration, Shri Ramswaroop Memorial College of Management,

Lucknow, Uttar Pradesh, India

[2]Research Scholar, JVN University, Jaipur, Rajasthan, India

ABSTRACT

In India, gold demand is also determined to a large extent by its price level and volatility. Commodity specific events such as the construction of new production facilities or processes, unexpected mine or plant closures, or industry restructuring. India is among the apex producers of a number of commodities and has a long history of trading in commodity derivatives. Commodity markets are efficient among all the commodity markets in terms of price risk management. The reasons for inefficiency of other commodity markets were found as low volume of trading during maturity period, lack of hedger's participation. The role of commodity futures markets in price discovery consists of anticipating the future spot price, which shapes resource allocation. The study is based on secondary data. The data has been collected through various web sites of commodity exchanges, commodity market bulletins and annual reports of Forward Market Commission. The data for the analysis included daily information on prices, traded volumes, open interest and patterns in participation.

KEYWORDS: Price Discovery, Spot Market, Futures Market, Value at Risk, Exchange Traded Funds

INTRODUCTION

Gold is the oldest precious metal known to man and for thousands of years it has been valued as a global currency, a commodity, an investment and simply an object of beautys. With regard to the investment value, more than two-thirds of gold total accumulated holdings is with central banks reserves, private players, and held in the form of jewellery. Less than one-third of gold's total accumulated holdings are used as "commodity" for jewellery in the western markets and industry. India, world's largest market for gold jewellery and a key driver of the global gold demand.

The domestic drivers of gold demand are largely independent of outside forces. Indian households hold the largest stock of gold in the world. Two thirds of the Indian demand for gold comes from the rural parts of the country. In 2012, gold's role as an inflation hedge bolstered its appeal in India. India imported around 850 metric tonne (MT) of gold in 2012.

Investors should consider the options available in their market, the form of investment that is appropriate to their circumstances, and the nature of professional advice they will require.

Investors can buy physical gold through coins or bars; they can buy products backed by physical gold, which offer direct exposure to the gold price; or they can buy other gold-linked products, which are directly related to the gold price but do not include ownership of gold.

In recent years, innovation has led to products that offer greater flexibility and accessibility to investors, such as exchange-traded funds (ETFs) as well as additional risk management tools for sophisticated investors, including derivatives and structured products.

OBJECTIVES

- To study the regulatory framework of the commodity derivative market in India.

- To analyse the gold demand & supply trends in the commodity futures market.

- To study the VaR (value at risk) of gold commodity in risk management.

- To examine the role of futures markets & spot market in the price discovery process.

HYPOTHESIS

H_O: **Futures market dominates spot market in the price discovery process.**

H_1: **Futures market does not dominate in the price discovery process.**

RESEARCH METHODOLOGY

The study is based on secondary data. The data has been collected through various web sites of commodity exchanges, commodity market bulletins and annual reports of Forward Market Commission.

The data for the analysis included daily information on prices, traded volumes, open interest and patterns in participation. This was obtained from three commodity exchanges: MCX, NCDEX and NMCE. The analysis was done for the two periods that the markets have been operational. Precious metal products is taken under the commodity head gold & commodity contract gold data is collected in three forms which are traded contract, quantity & value wise the given historical data is analyzed.

Regulatory Framework of Future Trading

There is a three tire regulatory structure of future trading in India i.e. Government of India, Forward Market Commission and Commodity Exchanges.

Government of India: The central government makes policy regarding the forward trading in commodities. At present, the Ministry of Consumer Affairs, Food and Public Distribution Department of government is dealing with commodity derivative trading.

Forward Market Commission: The commission came into existence in 1953 under the provisions of Forward Contract (Regulation) Act, 1952. As a statutory body it functions under the administrative control of the Ministry of Consumer affair. As per section 4 of the FC(R) Act, 1952, the commission performs the following roles:

- To advise the central government on the subject of assigning or withdrawal of recognition from any commodity exchange.

- To observe the forward market activities and to take necessary actions within the powers assigned to it under the Forwards Contract (Regulation) Act, 1952.

- To gather and publish obligatory information related with forward trading.

- To give recommendations regarding the improvements in working of future trading and commodity exchanges.

- To examine the accounts and other documents of any recognised exchange/association or any member of such organisation.

- To execute other functions assigned to the commission by FC(R) Act, 1952.

Commodity Exchanges: National Exchanges Regional Commodity Exchanges are MCX, NCDEX, NMCE, ICEX, ACE & 16 Regional Exchanges.

Gold Demand Trends

Gold demand in Q2 2014 was 964 tonnes, lower compared with Q2 2013 but in line with its 10 year average. Jewellery demand weakened year-on-year, but the broad 5-year uptrend remains intact. Investment demand pulled back from the extremes of last year amid relatively stable price conditions. Central banks continued to buy gold at a steady pace.
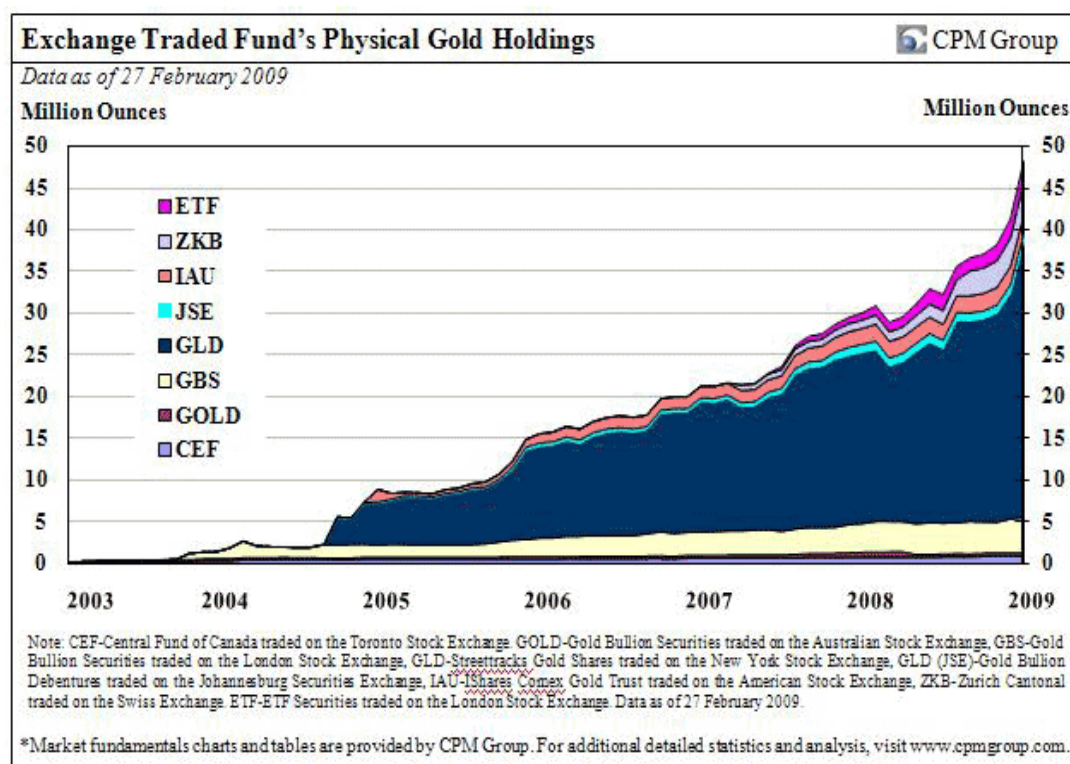
Figure 1

Central bank net purchases in the second quarter totalled 117.8t, the 14th consecutive quarter of net buying from this consistent category of demand. This marks a 28% increase over the same period in 2013, and brings H1 total net purchases to 242.1t. In value terms, net purchases in Q2 were worth US$4.9bn. Economic and geopolitical events throughout the world are sources of ongoing instability and uncertainty. Such events reinforce the requirement for appropriate risk management by central banks through holding gold reserves for asset diversification.

"Gold remains an important element of global monetary reserves" and further asserts that signatories currently "do not have any plans to sell significant amounts of gold." During Q2, sales under the current – third – agreement totalled less than 2.5t, with Germany again accounting for the majority of this owing to their coin-minting programme.
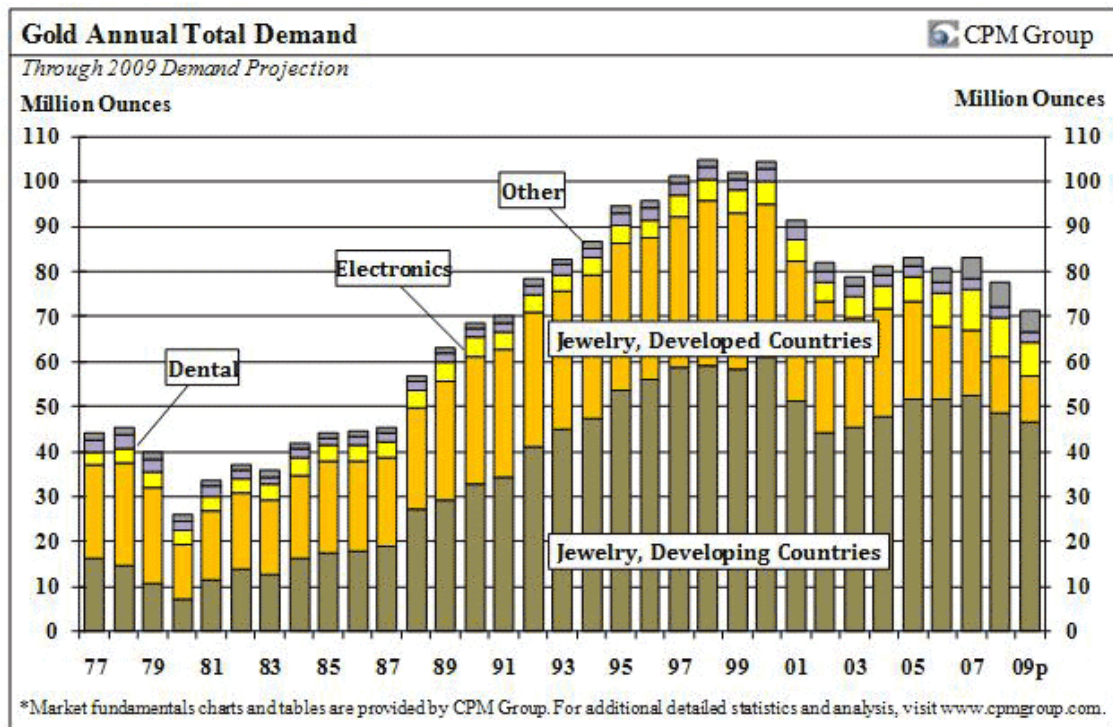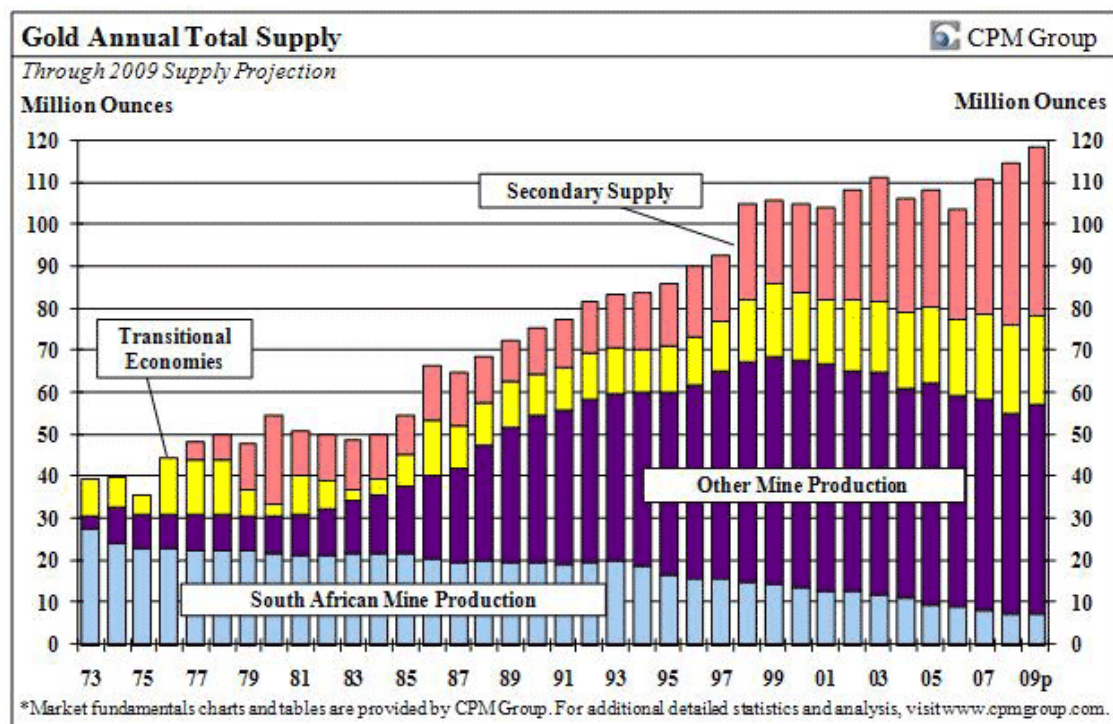
Figure 2

Figure 3

The supply of recycled gold year-to-date was its lowest since H1 2007 & Lower and more stable gold prices, as well as economic recovery in a number of Western markets, were the main reasons for the decline.

We aim to provide a holistic view of the gold market. As discussed in Gold Demand Trends Q1 2014, due to the breadth and complexity of the gold market, we believe a comprehensive analysis is best supported by a hybrid data

sourcing model. In addition to supply and demand data sourced from GFMS, Thomson Reuters, we use a large number of supplementary data sources to help inform our view of the market and provide additional insights. The gold market, however, is constantly evolving. We must assess continually how gold market data is sourced and presented to ensure its relevance and to maintain our ability to provide valuable market insights. Three of the leading gold supply and demand data providers are CPM Group, Metals Focus and GFMS, Thomson Reuters. Chart 10, below, presents these consultancies' estimates for 2013 gold jewellery fabrication demand for China, India and the US. As would be expected, country level estimates across providers are broadly consistent. Despite each data provider employing its own methodology, estimates across all three consultancies are similar. The biggest area of difference is China. This is perhaps to be expected given the tremendous growth in demand China saw in 2013.

VaR (Value at Risk)

VaR or Value at Risk measures maximum potential loss in value of an asset or portfolio over a defined period at a given confidence interval. VaR is used to estimate maximum downside risk of an investment. Thus, if the VaR of an asset is Rs. 10 lakh for a week at 95% confidence level, then it means Rs. 10 lakh is the maximum potential loss expected during any given week in that asset at 95% confidence level. There is, however, a 5% chance that the value of the asset will change by more than Rs. 10 lakh during a week.Underlying formula used for computation of VaR:: Market Value of the Asset * Confidence Factor * Volatility of the Holding Period

Annualized Actual Volatility (AAV) is measured as annualised standard deviation of the continuously compounded daily returns of the asset. It is also often referred to as realized, historical, or actual, asset volatility. The daily closing prices of front month futures contract are being used for computing natural logarithmic daily returns. When the front month contract enters into first day of tender period or day of expiry the closing prices of that day's and previous days of the next available contract would be considered for calculating daily returns. Simply put, daily returns on a day would be computed using closing prices of the same contract in order to avoid distortion during rollover of contracts. Consequently, we may obtain standard deviation on a series of continuously compounded daily returns of 1, 2 or more front month contracts.

The asset volatilities are expressed in annualized terms. The following formula is used to calculate the AAV.

$$AAV = 100 \times \sqrt{\left(\frac{300}{D}\right)\sum_{t=1}^{D}\left(ln\frac{P_t}{P_{t-1}}\right)^2}$$

Where, Pt and Pt-1 are the closing prices of the underlying futures on day 't' and the business day prior to day 't';D is the number of business days covered in the computation of respective historical volatility. The resultant volatility is expressed in percentage terms by multiplying with 100.

Price Discovery

The role of commodity futures markets in price discovery consists of anticipating the future spot price, which shapes resource allocation. In this role, the price produced by commodity futures exchanges is a public good: the producer can look up the price in a newspaper or on a website. FMC has installed a large number of price ticker boards in a large number of APMC mandies. The prices are also telecast/broadcast on many TV/radio channels. The producer does not need to directly participate in commodity futures trading in order to benefit from the price discovery that takes place on the exchange.

Methodology for Measurement

The question of price discovery pertains to the response of prices to the arrival of news and information. If there are multiple markets for the price of a certain commodity, price discovery answers which is the market whose price responds faster than prices in other markets to the arrival of news about the commodity. Between markets with leverage (such as the futures markets) and markets without leverage (such as the spot market), it is assumed that the prices in the former respond to information before prices in the latter. This is because traders require lower amounts of capital to trade in futures than in the spot. However, this has not always been observed to be true in practice, not just in India but all over the world.

Table 1: Information Share of the Futures (%)

Commodity	Period I	Period II
Gold	0.56	0.74
Gold Guinea	0.54	0.65
Gold International	0.55	0.78
Gold Hedge	0.56	0.74
Gold Petal	0.58	0.67

Period I: Information share for the full period (2003-2013).

Period II: Average of multiple (2003-2013) two year periods.

The analysis is done on the full period during which the new exchanges were operational, and measures the quality of price discovery by the futures markets using a measure called the Information Share (Hasbrouck, 1995). This measure captures the relationship between futures and spot prices as the fraction of news and information that arrives about the commodity is first discovered in the futures market. The measure takes a value between 0 and 1, in such a way that the sum of the information share of the futures and the spot price equals 1. When there is no information discovered in the futures price, the information share of the futures market is 0. This implies that the information share of the spot market will be 1. Typically, we consider that a given market dominates price discovery if the value of the information share of that market's price is higher than 0.5.

FINDINGS & RESULTS

The main finding is that the information share of the futures markets for the Gold commodity is higher than 0.5. This implies that, when information about the commodity arrives, the futures prices dominate the spot prices in reflecting that information, whether they are agricultural or non-agricultural commodities.

Table 1 reproduces the values of the information share from the paper. The first column of data in the Table is the information share values calculated for the full period. These values depict the average behaviour of the relationship between the futures and the spot prices. However, we know that there are several instances during this period where the futures markets were suspended from trading (except crude oil and gold). During these periods, the spot prices would have been the sole markets for discovering prices. The paper captures the dynamic nature of the relationship between futures and spot prices by calculating the information share measure for two-year periods at a time, rolling forward by a month. This shows what the information share for a given commodity would be for (say) at the start of the trading period in 2003-2005 compared to the information share during the last two years in 2011-2013. Over these shorter-term horizons also, on average, the futures markets dominate price discovery with a higher information share than the spot prices.

This evidence suggests that news and information gets captured first by the futures markets in India where after this information transmits to the spot market prices after, i.e., the futures price leads spot price in most cases.

CONCLUSIONS

Commodity markets are efficient among all the commodity markets in terms of price risk management. The reasons for inefficiency of other commodity markets were found as low volume of trading during maturity period, lack of hedger's participation. Investors should consider the options available in their market, the form of investment that is appropriate to their circumstances, and the nature of professional advice they will require.

Investors can buy physical gold through coins or bars; they can buy products backed by physical gold, which offer direct exposure to the gold price; or they can buy other gold-linked products, which are directly related to the gold price but do not include ownership of gold & information about the commodity arrives, the futures prices dominate the spot prices in reflecting that information, whether they are agricultural or non-agricultural commodities.

REFERENCES

1. Aggarwal N, Jain S, Thomas S (2014). "Price discovery and hedging effectiveness of commodity derivatives markets in India." *Technical report,* IGIDR, Bombay.

2. Aggarwal N, Thomas S (2012). "When stock futures dominate price discovery." *Technical report,* IGIDR.

3. Aggarwal N, Thomas S (2014). "Market quality in the time of algorithmic trading."*Technical report,* IGIDR.

4. Easwaran RS, Ramasundaram P (2008). "Whether commodity futures market in agriculture is efficient in price discovery? An econometric analysis." *Applied Economics Research Review,* 21, 337-344.

5. Elumalai K, Rangasamy N, Sharma RK (2009). "Price discovery in India's agricultural commodity futures markets." *Indian Journal of Agricultural Economics,* 64(3), 315-323.

6. Hasbrouck J (1995). "One security, many markets: Determining the contributions to price discovery." *Journal of Finance,* 50(4), 1175-1199.

7. Inoue T, Hamori S (2012). "Market efficiency of commodity futures in India." *Technical report*, Institute of Developing Economies, Discussion paper No. 370.

8. Jabir A, Gupta KB (2011). "Efficiency in agricultural commodity futures markets in India: Evidence from co-integration and causality tests." *Agricultural Finance Review,* 71(2), 162-178.

9. Kumar KK (2007). "Price leadership between spot and futures markets." *Technical report*, ISB, Hyderabad.

10. Ahuja, Narender L. (2006), "Commodity Derivatives market in India: Development, Regulation and Future Prospective", International Research Journal of Finance and Economics. Vol. 1 No. 2, pp. 153-162

11. Ali, Jabir and Gupta, Kriti Bardhan (2007), "Agricultural Price Volatility and Effectiveness of Commodity Futures Markets in India", Indian Journal of Agricultural Economics. Vol. 62, No.3, pp. 537.

12. Bhattacharya , Himdari (2007), "Commodity Derivatives Market in India", Economic and Political weekly, Money Banking and Finance Vol. 42 No. 13, pp. 1151-1162

13. Chakrabarty, Ranajit and Sarkar Asima (2010), "Efficiency of the Indian Stock Market with Focus on Some Agricultural Product", Paradigm Vol.14 No. 1, pp.85-96

14. Dummu, Tata Rao (2009), "Commodity Futures Market in India: Its Impact on Production and Prices", Indian Journal of Agricultural Economics, Vol. 64 No. 3, pp. 333-356.

15. Iyer, Vishwanathan and Pillai Archana (2010), "Price Discovery and Convergence in the Indian Commodities Market." Indian Growth and Development Review, Vol. 3 No.1, pp. 53-61

16. K. Lakhsmi (2007), "Institutional Investors in Indian Commodity Derivative Market- Prospective for the Futures",

17. Mahalik, M.K., Acharya, D. and Babu, S. (2009), "Price Discovery and Volatility Spill over's in Futures and Spot Commodities Market: Some Empirical Evidence from India", IGIDR Proceedings, pp. -062-10.